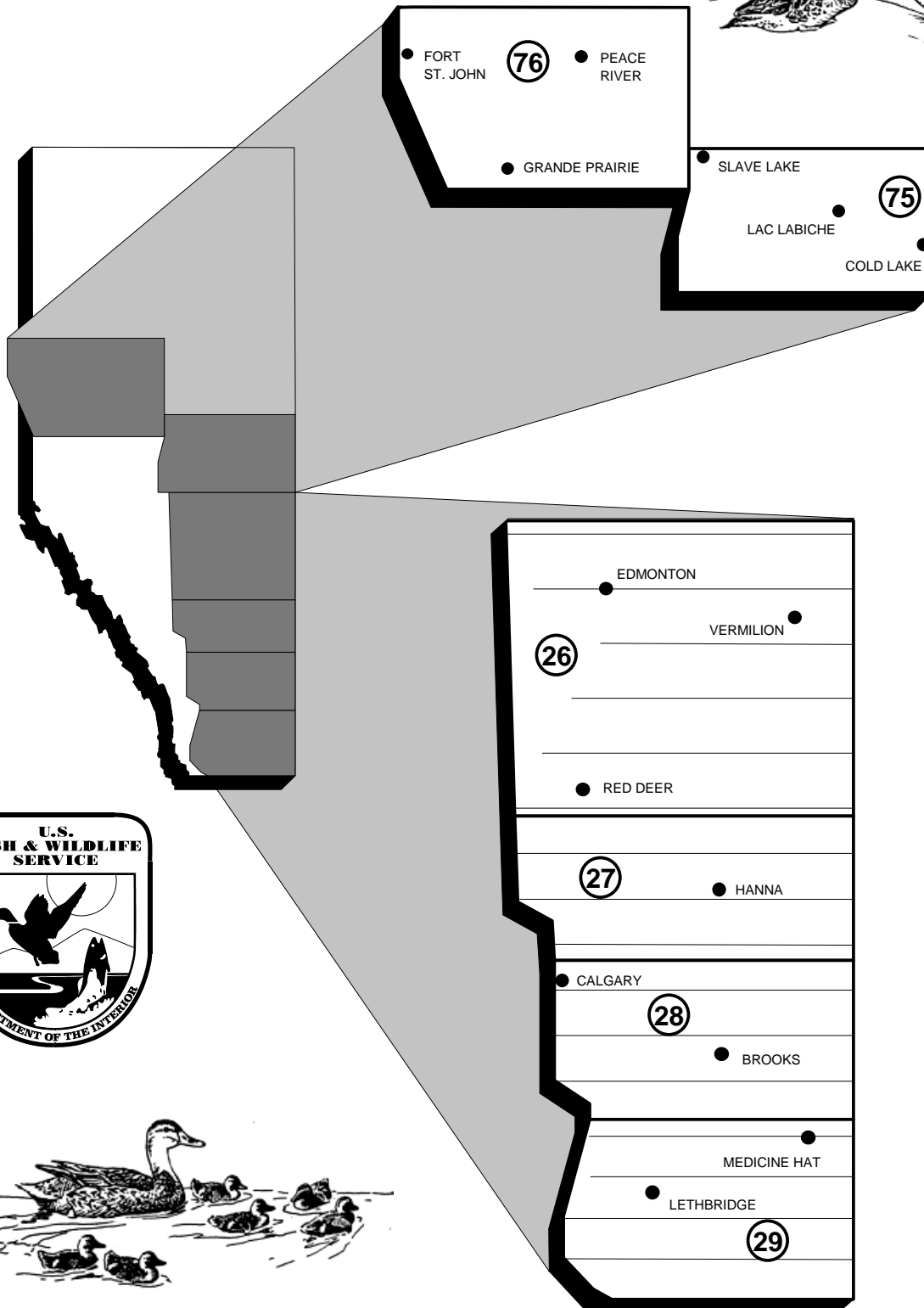
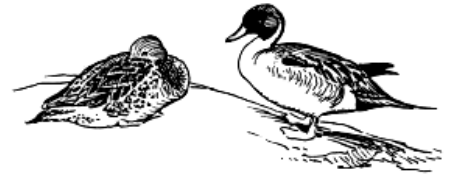


WATERFOWL PRODUCTION SURVEY

SOUTHERN AND CENTRAL ALBERTA

JULY 2002



TITLE: WATERFOWL PRODUCTION SURVEY FOR SOUTHERN
AND CENTRAL ALBERTA

STRATA SURVEYED: 26,27,28,29,75,76

DATES: July 10-18, 2002

DATA SUPPLIED BY: United States Fish & Wildlife
Service

Pilot/Observer Elizabeth Buelna, Flyway Biologist,
USFWS/WPS Klamath Falls, OR

Observer Alan Davenport, Computer Specialist,
USFWS, PWRC , Laurel, MD

ABSTRACT:

The 2002 Waterfowl Production Survey of Southern and Central Alberta was conducted from July 10-18. The duck brood index in southern Alberta of 29.5 thousand was a -39% decrease from 2001 and remained -73% below the long-term mean (Table 2). The late nesting index (61.8 thousand) increased +67% from last year, increased +5% from the 10-year mean, and increased +5% from the long-term mean (Tables 1 & 2). Precipitation was much below normal in most areas of Southern Alberta through out the winter and spring. Precipitation remained below average in June and early July , however, precipitation received during mid-June improved wetland conditions from May in southern portions of stratum 29 where pond levels and upland cover was in fair condition for late nesting birds. July pond counts increased +4.7% from last year and decreased -34.7% below the long term average (Table 3).

In Central Alberta, the duck brood index of 39.4 thousand was a +18% increase from last year and a +29% increase over the 10-year mean (Table 6). The late nesting index of 17.9 thousand was a increase of +112% over last year and a -2% decline over the 10-year mean. Nesting habitat in Central Alberta was generally fair to poor.

METHODS:

The procedures followed in conducting the survey are contained in the Standard Operating Procedures for Aerial Waterfowl Breeding Ground Population and Habitat Surveys, (SOP) Section IV(B), revised April 1987. The area surveyed for both Southern Alberta (Table 4) and Central Alberta was unchanged from 1996. This was the twelveth year of conducting an expanded production survey in Central Alberta (Table 8). Central Alberta strata 75 and 76 are the re-stratified lower portions of former stratum 19. A notebook computer was used to record voice observations and process field data according to formulas listed in the SOP.

The July aerial crew was the same as the May aerial crew for

Southern and Central Alberta. The entire survey was flown in a Cessna 206 aircraft, N-763. A total of 50 hours were flown to complete the survey. Survey dates for individual strata are as follows: stratum 29, July 10-11, stratum 28, July 11, stratum 27, July 12-13, stratum 26, July 13-15, stratum 75, July 15-18, stratum 76, July 16-17.

WEATHER AND HABITAT CONDITIONS:

Temperatures were above normal in June and July. Carway(209% of normal precipitation), Lethbridge(259% of normal precipitation) and Medicine Hat(231% of normal precipitation) were the wettest on record for the May-June period , while Edmonton(27% of normal precipitation) was the driest on record. Most areas north of Calgary are extremely dry as a result of several consecutive months of much-below-normal precipitation.

In Southern Alberta habitat conditions declined in strata 26-28 since May and improved in stratum 29. Total July ponds (not adjusted for visibility rates) decreased -31.8% from May 2002. Total July ponds increased +4.7% from July 2001, decreased -38.9% from the July 10-year mean, and decreased -34.7% from the July long-term mean (Table 3).

In Central Alberta total July ponds (not adjusted for visibility rates) decreased -55.7% from May 2002. Total July ponds decreased -22.2% from July 2001 and decreased -6.1% from the July 10-year mean (Table 7). The Cold Lake area received 30% of normal precipitation during the May 1 to June 30 period and the Peace River to Grande Prairie region received 38% to 79% of normal precipitation for the same period.

PRODUCTION INDICES:

In Southern Alberta the 2002 brood index of 29.5 thousand was a -39% decline from last year. Duck brood indexes decreased in all stratum. The average brood size increased to 4.9 from last years average brood size of 4.6 (Table 2). The coot brood index increased +23% from last year and remained -85% below the 10-year and -95% below the long-term averages.

The following is a table of duck brood age class composition by stratum, an indication of survey timing(raw data/not expanded).

Stratum	Class I	Class II	Class III	Unknown	Total
29	2	3	5	0	10
28	2	8	6	0	16
27	7	7	5	0	19
26	28	54	21	0	103
75	24	28	14	0	66
76	26	32	18	0	76
2002 Totals	89(30.7%)	132(45.5%)	69(23.8%)	0	290

2001 Totals	96(24.6%)	185(47.3%)	110(28.1%)	0(0%)	391
2000 Totals	98(26.7%)	177(48.5%)	91(24.8%)	0(0%)	366
1999 Totals	208(35.8%)	243(42%)	128(22%)	1(.2%)	580

LATE NESTING INDEX

The late nesting index (LNI) Tables 1, 2, 5 and 6 which is comprised of isolated drakes and pairs, has been used as a measure of secondary nesting attempts.

The 2002 total LNI for Southern Alberta of 61.8 thousand was a increase of +67% from 2001, an increase of +5% from the 10-year mean, and an increase of +5% from the long-term mean. The majority of this increase occurred in stratum 29. Dabblers increased +80% from 2001, increased +19% from the 10-year mean, and increased +41% from the long-term mean while divers changed +28%, -36%, and -41% from the same means. A rain event occurred in June (12 inches of rain in 24 hours) along the southern Alberta/northern Montana border, also known as the Milk River Ridge area. Ponds and reservoirs were filled and upland habitat has flourished since May. This weather event paired with the late spring resulted in LNI in this area increasing dramatically.

The total 2002 LNI index for Central Alberta of 17.9 thousand represents a +112% increase from 2001, and an -2% decrease from the 10-year mean. Total dabblers increased +138% from last year, and increased +42% from the 10-year mean. Total divers increased +59% from 2001 and decreased -71% from the 10-year mean. With a very late spring, the prairies being very dry and in poor condition in May, ducks appeared to be displaced to the Aspen Parklands and Peace Parklands of Strata 75 and 76 as observed by the increase in LNI.

CONCLUSIONS

1) The decrease(-39%) in the 2002 brood index was consistent with low breeding pair numbers recorded in May 2002 (-46.5% below long-term averages) and poor habitat conditions observed in May and July. Ducks appeared overcrowded in May due to the lack of wetlands. This intense competition for nesting territories has had a negative effect on nesting success and brood production.

2) The 2002 late nesting index was above the 10-year and long-term means due to a weather event in the southern portions of stratum 29 and a late spring.

3) The normal weather cycles in Prairie Canada generate the majority of rainfall from June to August(per Environment Canada). This allows farmers to grow their crops without irrigation. The rain usually stops by September in time for crops to mature and be harvested. This rainfall pattern paired with normal winter precipitation usually fills the prairie wetlands. This rainfall

pattern creates the recharge the wetlands need to help maintain pond levels and habitat for brood production in July. However, precipitation in the past decade in Alberta has been well below normal. This has resulted in poor habitat for broods and breeding pairs of ducks. The drought in Southern Alberta continues and has been compared to the dust bowl of the 1930's.

Submitted by: Elizabeth Buelna -July 26, 2002

Table 1. Long-term trend in waterfowl brood and late-nesting indices by species in Southern Alberta, 1955-2002 (index in thousands).

Species	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968
Broods:														
Duck brood index	299.5	257.9	347.8	387.9	228.3	186.8	216.0	133.4	204.2	191.6	107.1	172.6	168.0	95.9
Average brood size	6.0	6.1	6.3	6.2	5.3	6.1	5.7	5.5	5.9	5.9	6.4	6.4	6.4	4.8
Coot brood index	70.0	63.9	76.1	108.9	29.0	45.8	49.3	18.8	19.7	18.8	16.7	35.1	25.7	2.1
Late-nesting indices														
Dabblers:														
Mallard	8.9	5.9	4.3	5.0	8.3	3.4	0.9	1.4	1.7	3.3	12.3	9.8	9.0	11.9
Am. Black duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
Gadwall	3.9	1.0	2.0	2.0	6.1	1.3	0.9	0.3	0.7	1.2	8.0	4.6	3.9	6.8
Am. Wigeon	2.7	1.4	0.9	2.2	1.2	0.0	0.2	0.2	0.1	1.1	5.4	1.6	1.4	3.5
Am. Green-wing teal	0.2	0.0	0.2	0.0	0.7	0.0	0.1	0.0	0.0	0.0	0.4	1.6	3.3	1.5
Blue-winged teal	4.8	2.1	2.1	1.6	3.3	0.9	1.0	0.1	0.1	0.4	7.4	3.5	1.4	3.2
Northern shoveler	1.7	0.3	1.5	1.0	1.6	1.4	0.1	0.3	1.1	1.3	8.2	3.4	4.9	2.2
Northern pintail	4.5	1.7	0.5	1.3	1.6	1.2	0.8	0.0	0.1	0.3	7.8	7.6	5.3	4.1
Subtotal	26.7	12.4	11.5	13.1	22.8	8.2	3.9	2.2	4.2	7.6	49.5	32.0	29.2	33.1
Divers:														
Redhead	0.4	0.3	0.4	0.1	1.2	0.1	0.0	0.2	0.2	0.2	2.4	0.8	1.2	1.2
Canvasback	0.2	0.0	0.4	0.0	1.0	0.0	0.0	0.1	0.0	0.0	0.5	0.4	0.0	1.5
Scaups	11.6	12.5	10.4	10.8	10.7	5.4	2.6	1.1	1.4	3.2	11.5	6.5	4.6	7.0
Ring-necked duck	0.0	0.0	0.0	0.0	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
Goldeneyes	0.3	0.0	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.8
Bufflehead	0.3	0.1	0.0	0.3	0.6	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ruddy duck	2.0	7.1	1.9	3.4	2.5	4.0	1.0	0.6	2.4	0.9	5.1	4.8	1.5	3.6
Subtotal	14.7	20.1	13.5	15.0	16.8	9.7	3.7	2.0	3.9	4.3	19.7	12.7	7.4	14.0
Miscellaneous:														
Oldsquaw	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eiders	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scoters	0.1	0.0	0.2	0.2	0.4	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.0	1.8
Mergansers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.5
Subtotal	0.1	0.0	0.2	0.2	0.4	0.0	0.0	0.0	0.0	0.2	0.3	0.1	0.2	2.2
Unidentified:	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	23.5	24.0	12.2
Total	41.8	32.5	25.2	28.3	40.0	17.9	7.6	4.2	8.2	12.0	69.4	68.3	60.8	61.6

Table 1. Long-term trend in waterfowl brood and late-nesting indices by species in Southern Alberta, 1955-2002 (index in thousands).

Species	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Broods:															
Duck Brood Index	154.6	98.0	106.5	105.5	71.6	136.6	112.3	118.8	78.1	131.9	129.3	53.5	46.0	21.3	25.9
Average Brood Size	5.8	5.4	5.4	5.4	4.5	5.3	5.0	5.5	4.7	5.3	4.9	4.9	4.3	4.5	5.1
Coot Brood Index	14.7	13.3	13.6	12.6	8.5	8.2	35.0	17.7	9.6	19.9	27.2	17.2	27.0	10.3	15.2
Late-nesting indices															
Dabblers:															
Mallard	4.9	9.4	13.3	10.9	14.2	13.2	30.8	33.7	15.0	18.7	15.4	6.9	15.9	7.6	13.6
Am. Black Duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gadwall	1.5	9.4	5.2	2.8	3.7	8.7	18.0	10.6	1.9	8.7	10.6	3.0	3.4	3.1	5.2
Am. Wigeon	2.1	2.4	1.6	1.9	4.1	10.7	14.5	7.4	5.0	7.6	8.3	1.1	6.0	6.3	6.2
Am. Green-winged Teal	3.5	3.8	4.0	8.8	9.6	5.5	9.4	12.6	4.9	4.9	7.8	4.4	4.9	2.1	1.6
Blue-winged Teal	4.6	4.4	4.6	6.3	5.1	7.9	12.9	30.7	4.3	16.5	12.0	4.8	4.8	4.1	16.5
Northern Shoveler	2.0	3.8	3.3	2.1	4.0	2.2	17.8	6.2	5.4	5.2	4.4	3.9	4.7	2.4	2.4
Northern Pintail	7.0	4.2	7.5	5.6	2.8	6.4	13.5	15.5	3.3	7.1	6.5	3.1	4.3	2.6	2.8
Subtotal	25.7	37.3	39.5	38.3	43.5	54.6	116.9	116.7	39.8	68.6	65.0	27.3	43.9	28.4	48.3
Divers:															
Redhead	0.9	1.1	1.4	0.9	0.5	1.9	1.7	2.4	1.4	1.6	1.1	1.2	0.8	0.7	0.8
Canvasback	0.7	0.4	0.6	0.2	0.6	0.8	0.7	3.1	1.9	0.6	1.2	0.4	0.2	0.8	0.2
Scaup	8.1	11.7	10.1	11.0	5.9	15.4	31.2	44.9	15.4	24.3	32.1	6.6	8.6	6.5	14.8
Ringed-necked duck	0.0	0.7	1.3	0.2	0.0	0.0	1.1	0.6	0.4	1.3	0.0	0.0	0.7	0.2	0.0
Goldeneyes	0.2	0.0	0.0	0.0	0.2	0.0	0.4	0.4	0.2	0.5	0.4	0.0	0.0	0.0	0.0
Bufflehead	0.2	0.0	0.0	0.0	0.2	0.2	0.0	0.9	0.6	0.9	0.4	0.0	0.0	0.2	0.0
Ruddy duck	2.0	2.7	6.9	5.1	3.7	4.4	7.7	5.0	2.0	3.8	4.4	2.3	5.0	3.6	4.7
Subtotal	12.2	16.5	20.3	17.4	11.1	22.7	42.8	57.2	21.9	32.9	39.6	10.4	15.3	11.9	20.5
Miscellaneous:															
Oldsquaw	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eiders	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scoters	0.2	0.6	0.0	0.0	0.7	0.4	0.0	1.2	0.7	0.2	1.4	0.0	0.2	0.0	0.2
Mergansers	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Subtotal	0.2	0.6	0.0	0.0	0.7	0.5	0.0	1.4	0.7	0.2	1.6	0.0	0.2	0.0	0.2
Unidentified	23.4	27.6	31.1	18.1	17.3	28.6	0.0	0.0	0.9	9.0	11.3	3.6	4.6	0.0	0.0
Total	61.5	82.0	90.9	73.9	72.6	106.5	159.6	175.3	63.3	110.7	117.5	41.2	63.9	40.2	69.0

Table 1. Long-term trend in waterfowl brood and late-nesting indices by species in Southern Alberta, 1955-2002 (index in thousands).

Species	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Broods:														
Duck Brood Index	21.4	31.1	25.6	48.3	18.1	19.6	21.1	31.8	30.3	40.8	49.3	49.3	35.9	66.4
Average brood size	4.8	6.1	5.5	4.6	4.6	5.1	4.8	5.1	4.9	4.3	5.4	5.4	5.3	5.9
Coot brood index	10.3	9.4	16.4	13.3	3.0	2.5	6.6	3.8	2.6	5.5	17.5	22.9	4.7	2.8
Late-nesting index														
Dabblers:														
Mallard	11.0	9.3	14.7	10.6	8.7	16.3	10.7	8.6	6.6	9.6	12.1	16.2	22.5	20.3
Am. Black duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gadwall	3.4	4.1	6.7	5.7	4.3	7.4	4.8	1.2	3.0	5.7	4.3	9.5	23.1	15.8
Am. Wigeon	4.5	3.7	6.8	3.3	3.3	6.1	3.1	2.5	2.1	2.6	3.9	3.2	5.9	6.5
Am. Green-winged teal	1.4	1.8	0.2	1.7	2.0	0.4	0.4	0.7	1.2	1.2	1.9	3.3	1.5	2.3
Blue-winged teal	3.7	4.5	10.5	5.0	4.9	8.6	3.1	3.8	4.9	4.8	7.9	8.9	7.0	5.9
Northern Shoveler	0.7	1.6	2.5	0.9	1.5	2.3	1.7	1.0	0.6	0.6	1.7	3.4	3.9	4.8
Northern Pintail	1.1	3.3	5.2	4.0	3.2	3.4	2.5	1.5	0.4	2.6	0.9	1.5	7.0	7.1
Subtotal	25.8	28.3	46.6	31.2	27.9	44.4	26.2	19.4	18.8	27.2	32.8	46.0	71.0	62.7
Divers:														
Redhead	0.8	0.9	0.9	1.5	0.7	2.9	0.9	0.7	0.6	0.8	1.1	1.3	3.0	1.3
Canvasback	0.0	0.4	0.2	0.7	1.3	0.0	0.0	0.7	0.2	0.4	0.0	0.6	0.5	1.8
Scaup	4.1	5.5	14.0	7.9	6.7	7.0	8.7	3.6	3.8	5.9	11.6	6.7	7.7	5.8
Ring-necked duck	0.6	0.2	0.2	0.2	1.7	1.2	0.2	0.4	0.4	0.5	0.2	1.4	5.7	0.6
Goldeneyes	0.0	0.0	0.0	0.2	0.0	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.4	0.0
Bufflehead	0.0	0.0	0.2	0.2	1.9	1.6	0.0	0.0	0.2	0.2	0.0	0.0	2.9	3.7
Ruddy duck	1.4	1.4	6.3	4.4	4.1	10.6	5.7	2.1	0.9	2.8	4.1	5.6	8.8	6.3
Subtotal	6.9	8.4	21.7	15.2	16.3	13.5	15.7	5.5	5.1	10.7	17.0	15.6	29.0	19.5
Miscellaneous:														
Oldsquaw	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eiders	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scoters	0.0	0.2	0.0	0.0	0.6	0.4	0.6	0.2	0.4	0.2	0.0	0.0	0.0	0.0
Mergansers	0.0	0.0	0.2	0.0	0.7	0.0	0.5	1.6	0.0	0.5	0.0	0.0	0.2	0.0
Subtotal	0.0	0.2	0.2	0.0	1.3	0.4	1.1	1.8	0.4	0.7	0.0	0.0	0.2	0.0
Unidentified	0.0	0.0	3.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	32.7	36.9	71.6	46.9	45.5	58.3	43.0	26.7	24.2	38.6	49.8	61.6	100.2	82.2

Table 1. Long-term trend in waterfowl brood and late-nesting indices by species in Southern Alberta, 1955-2002 (index in thousands).

Species	1998	1999	2000	2001	2002
Broods:					
Duck brood index	38.3	78.9	48.7	48.4	29.5
Average brood size	5.2	4.4	4.5	4.6	4.9
Coot brood index	0.6	1.6	5.2	0.8	1.0
Late-nesting indices					
Dabblers:					
Mallard	22.9	11.9	6.5	11.8	20.4
Am.Black duck	0.0	0.0	0.0	0.0	0.0
Gadwall	16.1	12.4	5.3	6.5	10.9
Am.Wigeon	8.7	8.5	4.1	3.4	6.2
Am. Green-winged teal	0.9	1.5	1.3	0.4	2.0
Blue-winged teal	12.7	10.6	4.6	5.1	8.0
Northern shoveler	6.4	3.6	0.6	0.9	3.6
Northern Pintail	7.0	2.9	1.1	0.9	1.0
Subtotal	74.6	51.4	23.6	28.9	52.1
Divers:					
Redhead	1.8	2.8	1.1	1.0	0.7
Canvasback	2.6	1.3	0.5	1.1	0.3
Scaup	5.3	3.7	3.2	2.3	1.8
Ring-necked duck	1.0	1.7	0.6	0.6	0.7
Goldeneye	0.8	0.0	0.0	0.0	0.4
Bufflehead	2.7	0.4	1.2	0.7	1.2
Ruddy duck	6.4	2.3	4.6	1.7	4.4
Subtotal	20.5	12.3	11.2	7.5	9.5
Miscellaneous:					
Oldsquaw	0.0	0.0	0.0	0.0	0.0
Eiders	0.0	0.0	0.0	0.0	0.0
Scoters	0.0	0.0	0.0	0.0	0.0
Mergansers	0.4	0.0	0.2	0.6	0.2
Subtotal	0.4	0.0	0.2	0.6	0.2
Unidentified	0.0	0.0	0.0	0.0	0.0
Total	95.5	63.7	35.0	37.0	61.8

Table 4. Survey design for Southern Alberta, July 2002.

	STRATUM				
	26	27	28	29	Total
<u>Survey design</u>					
Square miles in stratum	26,448	11,724	12,890	13,235	64,297
Square miles in sample-waterfowl/ponds	272.25	144.0	155.25	85.5	657.0
Linear miles in sample	2,178	1,152	1,242	684	5,256
Number of transects in sample	11	6	7	4	28
Number of segments in sample	121	64	69	38	292
Expansion factor	97.1460	81.4167	83.0274	154.7953	97.8645
<u>Current year coverage</u>					
Square miles in sample-waterfowl/ponds	126.0	72.0	65.25	85.5	348.75
Linear miles in sample	1,008	576	522	684	2,790
Number of transects in sample	6	3	3	4	16
Number of segments in sample	57	32	29	38	156
Expansion factor	209.9048	170.961	197.5479	154.7953	